

REMARKS / ARGUMENTS

The above identified patent application has been amended and reconsideration and reexamination are hereby requested.

Claims 1 and 3 – 8 are now in the application. Claim 2, 13 and 20 have been previously cancelled. Claims 9 – 12, 14 – 19 and 21 have been previously withdrawn. Claims 1 and 3 – 8 have been amended. Claims 22 and 23 have been added.

The Examiner has rejected Claims 1 and 3 – 8 under 35 U.S.C. §102(b) as being anticipated by Tarui et al.

The Applicant's amended Claim 1 now calls for (underlining added for emphasis) ... preparing a space which is essentially enclosed by a container and has a wafer/hybrid chuck which is located therein and has the purpose of holding a semiconductor wafer and/or hybrid applied to the wafer/hybrid chuck; pre-cooling a dry fluid in a heat exchanger outside the space; conducting the pre-cooled fluid out of the heat exchanger into the wafer/hybrid chuck via a first line, and then through the wafer/hybrid chuck to cool the wafer/hybrid chuck; conducting at least a portion of the fluid having been conducted through the wafer/hybrid chuck to the heat exchanger via a second line out of the wafer/hybrid chuck to the heat exchanger; and heating the portion, by using a residual coldness of the portion to cool the heat exchanger to contribute to the pre-cooling of the fluid in the heat exchanger; wherein the heated portion is conducted via a third line from the heat exchanger into the space, before being allowed to flow out within the space to condition the atmosphere in the space.

The Applicant's amended Claim 6 now calls for (underlining added for emphasis) ... preparing a space which is essentially enclosed by a container and has a wafer/hybrid chuck which is located therein and has the purpose of holding a semiconductor wafer and/or hybrid applied to the wafer/hybrid chuck; pre-cooling a dry fluid in a heat exchanger outside the space; conducting the pre-cooled fluid out of the heat exchanger into the wafer/hybrid chuck via a first line, and then through the wafer/hybrid chuck to cool the wafer/hybrid chuck; wherein at least a portion of the fluid having been conducted through the wafer/hybrid chuck is used to condition the atmosphere within the space; wherein a first portion of the fluid having been conducted through the wafer/hybrid chuck is firstly conducted via a second line out of the

wafer/hybrid chuck to the heat exchanger, then heated by using a residual coldness of the first portion to cool the heat exchanger to contribute to the pre-cooling of the fluid in the heat exchanger, and then conducted via a third line from the heat exchanger into the space, before being allowed to flow out within the space, and wherein a second portion having been conducted through the wafer/hybrid chuck is allowed to flow out within the space directly after it leaves the wafer/hybrid chuck.

Support for the claim amendments is found in the Specification as originally filed. The term “holding device” has been replaced by “chuck”, based on page 2, line 6 of the Specification. The words “applied to the wafer/hybrid chuck” have been added, based on page 1, line 12 in connection with page 2, line 6 of the Specification. The expression ‘portion of the fluid having left’ has been replaced by “portion of the fluid having been conducted through”, based on page 9, line 3 of the Specification. The second line has been specified to lead out of the wafer/hybrid chuck, based on the wording of original claim 13. The third line has been specified to extend from the heat exchanger into the space, based on the wording of original claim 10 and figure 3. The description on page 10, lines 14 to 16 discloses that a residual coldness of the portion of the fluid having been conducted through the wafer/hybrid chuck is used to cool the heat exchanger, in this way according to page 9, lines 33-36 contributing to the pre-cooling of the fluid in the heat exchanger. New claims 22 and 23 find support on page 3, lines 20-22 of the Specification. This part of the Specification, according to the remark on page 7, lines 20-22, is relevant to all of the figures.

According to the amended independent Claims 1 and 6, the dry fluid after having been pre-cooled in the heat exchanger is conducted successively first through the first line, then through the wafer/hybrid chuck, then through the second line back to the heat exchanger. Because the first line leads out of the heat exchanger into the wafer/hybrid chuck and the second line leads out of the wafer/hybrid chuck to the heat exchanger, which is located outside the space, the fluid portion remains separate from the space during these steps, which the claims confirm to happen before (= without, at this stage) allowing the fluid portion to flow out within the space. In this way, the fluid portion is enabled to cool the wafer/hybrid chuck including the wafer, which by being applied to the chuck is in thermal contact with it, substantially without undesirably lowering the

temperature of the atmosphere in the space. Thereby the fluid portion retains a residual coldness, which then is used to cool the heat exchanger to contribute to the heat exchanger's task of pre-cooling freshly supplied fluid. It is only after having contributed in this way and thereby given up its residual coldness that the portion is allowed to flow out within the space. In this way, the dry, pre-cooled fluid used for cooling the wafer is re-used in a two-fold-way.

(1) its coldness is utilized in the heat exchanger for the pre-cooling of freshly supplied fluid.

(2) its dryness is utilized for conditioning the atmosphere within the space at a desired temperature that is higher than the temperature of the wafer.

As such, the two separate tasks of providing a cool wafer and a warmer, dry atmosphere surrounding it, can be performed with only a small amount of energy. The Applicant submits that Tarui et al. fails to disclose or render obvious such an arrangement.

Tarui et al. discloses a method for drying semiconductor wafers in which a plurality of wafers are arranged vertically on a horizontal boat 19 in a vessel 11. By heating liquid IPA at the bottom of the vessel using a first heat exchanger tube 17, dry IPA vapor is generated such that it flows out within the vessel and among the wafers. Second heat then is passed through a drain pipe 22 over the inner wall of the vessel to its bottom (column 4, line 25-31) where again it is heated by the first heat exchanger tube 17. The wafer boat 19 and wafers, being positioned away from the inner walls of the vessel, thus are never reached by the IPA cooled by the second heat exchanger tube 21 but are maintained at the temperature of the IPA vapor generated by the first heat exchanger tube 17.

The Applicant submits that there is no hint or suggestion in Tarui et al. for the measures by which the present invention achieves to condition a wafer at a lower temperature than a surrounding atmosphere, i.e., for providing a chuck to which the wafer can be applied and for transporting pre-cooled fluid between the heat exchanger and the chuck through lines such that the fluid flows out within the space only after it has been heated in the heat exchanger. Moreover, since Tarui et al. is concerned solely with drying wafers, it does not provide any motivation for conditioning a wafer at a temperature lower than the surrounding atmosphere, even teaching (column 4, line 66 to column 5,

line 4) to increase the temperature of the wafers beyond that of their surroundings by irradiating them with infrared rays.

As such, the Applicant submits that Claims 1 and 6 are not anticipated by Tarui et al. under 35 U.S.C. §102(b).

Claims 3, 4, 5 and 8 are dependent on Claim 1. Claim 7 is dependent on Claim 6. As such, these claims are believed allowable based upon Claims 1 and 6.

In accordance with a telephone Interview held by Examiner Gravini and Attorney Paciulan on April 15, 2010, the proposed amendments to independent Claims 1 and 6 (as set forth herein) in view of the Tarui et al. reference were discussed. The general thrust of the arguments discussed were as set forth above. The Examiner indicated that the proposed amendments would likely overcome the Tarui et al. reference.

Therefore, in view of the above amendment and remarks it is submitted that the claims are patentably distinct over the prior art and that all the rejections to the claims have been overcome. As such, allowance of the above Application is requested.

Respectfully submitted,
F. CHAU & ASSOCIATES, LLC

Date: APRIL 22, 2010

By 

Richard J. Paciulan
Reg. No. 28,248

Mailing Address:

F. CHAU & ASSOCIATES, LLC
130 Woodbury Road
Woodbury, New York 11797
TEL: (516) 692-8888
FAX: (516) 692-8889